

ABSTRACT OF THE DISCLOSURE

A system for performing an end-to-side vascular anastomosis, including an anastomosis device, an application instrument and methods for performing a vascular anastomosis. The system is applicable for performing an anastomosis between a vascular graft and the ascending aorta in coronary artery bypass surgery, particularly in port-access CABG surgery. A first aspect of the invention includes a vascular anastomosis staple. A first configuration has two parts: an anchor member, forming the attachment with the target vessel wall and a coupling member, forming the attachment with the bypass graft vessel. The anastomosis is completed by inserting the coupling member, with the graft vessel attached, into the anchor member. A second configuration combines the functions of the anchor member and the coupling member into a one-piece anastomosis staple. A second aspect of the invention includes an anastomotic fitting, having an inner flange over which the graft vessel is everted and an outer flange which contacts the exterior surface of the target vessel. A tailored amount of compression applied by the inner and outer flanges grips the target vessel wall and creates a leak-proof seal between the graft vessel and the target vessel. A third aspect of the invention has a flange to which the graft vessel attaches, by everting the graft vessel over the flange, and a plurality of staple-like members which attach the flange and the everted end of the graft vessel to the wall of the target vessel to form the anastomosis.